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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/735,694

12/16/2003

Shigetaka Hamada

10517/198

3515

23838 7590 08/10/2007
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EXAMINER

BERHANU, SAMUEL

ART UNIT

PAPER NUMBER

2838

MAIL DATE

DELIVERY MODE

08/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/735,694

Applicant(s)

HAMADA ET AL.

Examiner

Samuel Berhanu

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2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchner et al. (DE 196 49 434 C1) in view of Yi et. al. (US 6,586,123), and further in view of Reher et. al. (US 5,215,834).

Regarding Claim 1, Buchner et al. disclose, a diagnostic method for a fuel cell comprising a plurality of cells, comprising: supplying an anode of the fuel cell with hydrogen or a hydrogen-containing gas; supplying a cathode with an inert gas or vacuuming the cathode; measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell and the inert gas is supplied to the cathode or the cathode is vacuumed, wherein an operation state of the fuel cell battery is changed when measuring the voltage of a cell; and determining an amount of cross-leak based on the measured gas pressure at the anode, the measured gas pressure at the cathode, and on a measured voltage of each cell. (Page 1, Paragraph 2, Page 2, paragraph 6 and Page 3, Paragraph 1).

Buchner et. al. do not disclose measuring gas pressure at the anode; measuring a gas pressure at the cathode.

Yi et. al. disclose in Figure 1, elements 40 and 42 ring a gas pressure at the anode; measuring a gas pressure at the cathode. (See also Column 4, lines 34-39, lines 44-48).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use a gas pressure measuring means (instead of calculating the pressure) in Buchner et. al. gas leak determination method as taught by Yi et. al. in order to avoid errors that could be introduced using formulas and mathematical equations.

Further, Neither Buchner et al. nor Yi et. al. disclose explicitly introducing a cooling medium into a battery of the fuel cell; and changing a temperature of the cooling medium when measuring the voltage of each cell. However, Reher et. al. disclose in Figures 1 and 4, a cooling medium (a flow path) into a battery of the fuel cell; and changing a temperature of the cooling medium when measuring the voltage of each cell (Column 2, lines 34-64). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use air flow means as taught by Reher et. al. in Buchner Fuel cell test system in order to maintain a desire temperature during fuel cell test and obtain accurate test result, and also to prevent the system from discharging below a predetermined stage of charge.

Regarding Claim 2, Buchner et al. disclose, wherein in the determining step, an amount of hydrogen cross-leak of each cell is determined from the measured voltage of each cell generated based on a principle of a hydrogen concentration cell (Page 2, Paragraph 2).

Regarding Claim 3, Buchner et al. disclose, detecting an amount of the inert gas supplied to the cathode; and calculating an amount of cross-leak based on the pressure of the hydrogen-containing gas at the cathode, on the total pressure of the inert gas supplied to the cathode, and on the amount of the inert gas supplied to the cathode (Page 3, lines 11-30, Page 4, lines 10-29).

Regarding Claim 4, Buchner et al. disclose, wherein the voltage of each cell is measured in a state where the plurality of cells are stacked (Page 1, Paragraph 3)

Regarding Claim 5, Buchner et al. disclose, changing at least one of the gas pressure at the anode and the gas pressure at the cathode when measuring the voltage of each cell (Page 2, Paragraph 2) (noted that the formula in Page 3, line 15 teaches that the voltage of each cell can be calculated with different value of pressure).

Regarding Claim 7, Buchner et al. disclose, wherein the inert gas supplied to the cathode is nitrogen (Page 3, line 3).

3. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchner et al. (DE 196 49 434 C1) in view of Muchinc et. al. (US 6,558,824), in view of in view of Yi et. al. (US 6,586,123), and further in view of Reher et. al. (US 5,215,834).

Regarding Claim 8, Buchner et al. disclose, a diagnostic method for a fuel cell comprising a plurality of cells, comprising: supplying an anode of the fuel cell with hydrogen or a hydrogen-containing gas; measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell, and determining an amount of cross-leak based on the measured gas pressure at the anode, the measured gas pressure at the cathode and on a measured

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voltage of each cell (Page 1, Paragraph 2, Page 2, paragraph 6 and Page 3, Paragraph 1). Buchner et. al. do not disclose explicitly the cathode is vacuumed. However, Muchinc et. al. disclose in the abstract, column 2, lines 1-5, and claims 8 and 19, the cathode is vacuumed. It would have been obvious to a person having ordinary skill in the art at the time of the invention to add a vacuum injecting means in Buchner et. al. fuel cell stack as taught by Muchine et. al. in order to remove the water to ensue proper test results and provide effective fuel cell leak monitoring system. Neither Buchner et. al. nor Muchinc et. al. disclose measuring a gas pressure at the anode; measuring a gas pressure at the cathode at the cathode.

Yi et. al. disclose in Figure 1, elements 40 and 42, measuring a gas pressure at the anode; measuring a gas pressure at the cathode at the cathode (see also Column 4, lines 34-39, lines 44-48).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use a gas pressure measuring means (instead of calculating the pressure) in Buchner et. al. gas leak determination method as taught by Yi et. al. in order to avoid errors that could be introduced using formulas and mathematical equations.

Further, Reher et. al. disclose in Figures 1 and 4, a cooling medium (a flow path) into a battery of the fuel cell; and changing a temperature of the cooling medium when measuring the voltage of each cell (Column 2, lines 34-64). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use air flow means as taught by Reher et. al. in Buchner Fuel cell test system in order to maintain a

desire temperature during fuel cell test and obtain accurate test result, and also to prevent the system from discharging below a predetermined stage of charge.

Regarding Claim 9, Buchner et al. disclose, wherein in the determining step, an amount of hydrogen cross-leak of each cell is determined from the measured voltage of each cell generated based on a principle of a hydrogen concentration cell (Page 2, Paragraph 2)

Regarding Claim 10, Buchner et al. disclose, wherein the voltage of each cell is measured in a state where the plurality of cells are stacked (Page 1, Paragraph 3)

Regarding Claim 11, Buchner et al. disclose, changing at least one of the gas pressure at the anode and the gas pressure at the cathode when measuring the voltage of each cell (Page 2, Paragraph 2) (noted that the formula in Page 3, line 15 teaches that the voltage of each cell can be calculated with different value of pressure).

Response to Arguments

4. Applicant's arguments filed 5/29/2007 have been fully considered but not persuasive.

5. In response to applicant's argument that Reher is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case,

Reher is directed to thermal control sytem for power supply and measurements during temperature variation as Bucher.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel Berhanu whose telephone number is 571-272-8430. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SB


BAO Q. VU
PRIMARY EXAMINER